NOTES AND EXTRACTS.

The following account of the cyclone at Mauritius, mentioned in the May *Review*, is taken from *La Nature* of May 10th: "The cyclone burst on the island (Reunion) during the night of March 20th to 21st, with exceeding violence, which abated only during the forenoon of the 22nd. The barometer at 12:30 p. m. March 21st had fallen to 727 mm. (28.62 inches), one of the most marked depressions observed in a great number of years. On the morning of the 20th the mercury had already touched 759 mm. (29.88 inches). * * * * Thirty-five persons perished, buried under the ruins of their dwellings or drowned. Many were wounded. The greater part of the public buildings and private residences are more or less damaged." It further states that 21 ships, putting to sea at the instance of the Captain of the Port, were saved. Three vessels were dismantled or lost, but the crews were saved. Great damage was done to growing crops, roads, quays, &c. The cyclone raged with much less force at Manritius than at Reunion.

[*From Nature, June* 12, 1879.]

The Paris Academy of Meteorological Ascents has inaugurated the series of its ærial ascensions. The first took place at St. Mandes and the second at Arcueil on the occasion of opening the Ecole Laplace. The ascensionists propose to take photographs from the car in order to ascertain the position of the balloons and make a verification of the laws of barometric height. The original idea of this difficult operation may be attributed to Laverrier. Each of the ascents will be followed by the publication of diagrams and scientific results obtained.

[*From the American Journal of Science and Arts, July*, 1879.]

Prof. *Elias Loomis* in his eleventh paper of "Contributions to Meteorology" gives the results of his study of the winds on the summit of Mt. Washington compared with the winds near the level of the sea, and "abnormal storm paths," based upon the published records of the United States Signal Service. In the investigation of the first subject he "selected all those cases in which the direction of the wind on Mt. Washington differed at least 90° from that at each of the stations, Burlington, Boston and Portland, Me. The number of these cases was 507. Three-fifths of these occurred when the wind on Mt. Washington was from W. or NW., and over four-fifths when it was from one of the points, N., NW., W. or SW. At the same time the wind at the low stations was generally from S., SE., E. or NE." As the table and details of this work were considered too voluminous for publication, he "adopted a different standard of selection, and took all those cases in which the barometer at Portland, Me., fell as low as 29.6 inches. The total number of these cases was 89," occurring from October, 1872, to March, '77. "It is noticed that for several observations preceding the minimum pressure the surface winds generally were from S., SE., E., or NE., (assumed for convenience to be the east quarter) and that about the time of minimum pressure the wind changed to N., NW., W. or SW., (assumed for convenience to be the west quarter.) On the summit of Mt. Washington a similar change of wind is sometimes noticed, though not invariably. The average of the pressures of the centre of those low areas in which the wind on Mt. Washington changed to the east quarter was 29.47, and in which no such change occurred the average was 29.47. In a comparison of cases in which an area of low pressure passed over New England, when the barometer at Portland, Me., did not fall to 29.6 inches it was found that during the continuation of seven-eights of them the wind on Mt. Washington did not at any time blow from the east quarter. He," therefore, thinks we are justified in inferring the following conclusions:

1st. In a majority of those cases in which an area of low barometer passes over New England attended by the usual system of circulating winds at the surface stations, this system of circulating winds does not extend to the height of 6.000 feet.

2nd, When the depression of the barometer is unusually great, this system of circulating winds extends to the greatest height.

3rd, When, during the progress of an area of low pressure, a system of circulating winds reaches to the summit of Mt. Washington, the change of wind to the east quarter usually begins at the surface stations eleven hours sooner than it does on the summit of that mountain; and the change back from the east to the west quarter usually begins at the base of the mountain five hours sooner than on the summit."

In the study of the second subject he selected those cases in which storm paths deviated most from the average course, (easterly,) and separated them into two classes, one containing those cases in which the direction was most northerly and the other those in which it was most southerly. On comparing these classes the following results are arrived at: In storms moving towards the north the average course was 20° east of north; the average depression below the mean at the centre of low area was found to be 0.26 inch. greater at the last than at the first observation; the average temperature on the north side of low area was 9°.5 below the mean and on the south side 14°.7 above; the average velocity of the south winds was ten per cent. greater than that of the north winds; the average rain-fall in eight hours within the low areas was 6.89 inches. In storms moving towards the south the average depression at the last observation was somewhat less than at the first, and less than half what it was at an intermediate date; the average temperature on north side was 12° below the mean and on south side 17° above; the average velocity of the north winds was about double that of the south winds, and the average rain-fall was only 0.57 inch. In both classes the average humidity on the north side was nearly the same, but on the south side it was 88 per cent. in the former and 71 in latter. He therefore considers that "the most remarkable circumstance which characterizes these two classes of storms is the difference in the rain-fall;" "that this appears to be the general characteristic of those storms which originate near the Gulf of Mexico," and that "the south wind is warm, moist and pushes northward with great force." The principle object had in view was to determine, if possible, the

reason why these storms pursued so unusual a path. In those moving northwards the centre of low pressure moved nearly towards the centre of the rain-area, and "this coincidence seems to favor the conclusion that in a great storm the condensation is an efficient cause which controls the movements of the winds;" but in those moving southward" the storm-centre did not generally follow the rain-areas, but moved away from it," and "in these cases the facts seem to show that the rain-fall exerted no appreciable influence upon the course of the storm or upon the fall of the barometer." In several cases the sky was entirely cloudless at every station on the south side of the low area. "This evidence appears to me to show that heavy and extensive precipitation does not invariably precede the first formation of depression areas, and accompany their expansion, as has been claimed. These depression areas increased in intensity when the rain-fall was nearly zero, and while the sky on the south side was not generally overcast with clouds, but in several cases was almost entirely clear. In the United States depression areas do not generally begin with extensive precipitation, but the rain-fall is a concomitant after the system of circulating winds has become pretty well established. The depression of the barometer is the result of a system of circulating winds, and the most frequent cause producing such a system appears to be two or more areas of high pressure at a considerable distance (frequently 1,400 miles) from each other. Differences of temperature and of humidity are also important agents in producing and sustaining such a system of winds. When a system of circulating winds has been formed over a large extent of country, there almost invariably results a fall of rain; and if the rain-fall is abundant, and extends over a large area, it becomes a very important agent in modifying the direction and force of the winds. The principal question still remains undecided: Why did the storms in table No. II pursue a course so nearly from south to north and those in table No. I.I a course nearly from north to south? The average course of storm paths appears to be determined mainly by the average system of circulation of the atmosphere near the earth's surface, and occasional departures of storm paths from this average track appear to be mainly due to causes which render the general movement of the atmosphere at such times different from the average movement."

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